

Response Under 37 CFR 1.116

Expedited Procedure

Examining Group 1752

Application No. 10/773,559

Paper Dated September 20, 2007

In Reply to USPTO Correspondence of June 20, 2007

Attorney Docket No. 1217-040223

REMARKS

The final Office Action of June 20, 2007 has been reviewed and the Examiner's comments carefully considered. The present Amendment amends claims 16 and 17 in accordance with the specification and drawings as originally filed. No new matter has been added. The present amendment also cancels claims 20 and 39. Claims 1-15, 32-38 and 51 were withdrawn from further consideration in view of an earlier restriction requirement. The Applicants reserve the right to file a divisional application directed to the non-elected claims. Accordingly, claims 16-19, 21-31 and 40-50 are currently pending in this application, and claims 16 and 17 are in independent form.

35 U.S.C. §102/§103 Rejections

Claims 16-31 and 39-50 stand rejected under 35 U.S.C. §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as obvious over United States Patent No. 6,232,026 to Lambert (hereinafter "the Lambert patent"). In view of the above amendments and the following remarks, the Applicants respectfully request reconsideration of this rejection.

As defined by independent claim 16, the present invention is directed to a coated carrier comprising a carrier core material and a resin coating layer with which the carrier core material is coated. The carrier core material contains at least one metal oxide ($M^L O$) having a melting point of not higher than 1000°C, and at least one metal oxide ($M^H O$) having a melting point of not lower than 1800°C. The metal oxide ($M^H O$) is selected from the group consisting of ZrO_2 , TiO_2 and Ta_2O_5 , and the metal (M^H) for constituting the metal oxide ($M^H O$) has an electrical resistivity of not less than $10^{-5} \Omega \cdot cm$. A part of the metal oxide ($M^H O$) is independently present in the carrier core material for forming the coated carrier.

As defined by independent claim 17, the present invention is directed to a coated carrier comprising a carrier core material, and a resin coating layer with which the carrier core material is coated. The carrier core material comprises a ferrite component having composition represented by the following formula: $(MO)_y(Fe_2O_3)_z$. In the formula, y and z are each expressed in % by mol and are numbers satisfying the conditions of $40 \leq z <$

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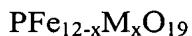
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100 and $y+z=100$. M is a metal selected from Fe, Cu, Zn, Mn, Mg, Ni, Sr, Ca and Li. MO is one or more oxides selected from oxides of these metals, and contains, in the ferrite component, at least one metal oxide ($M^L O$) having a melting point of not higher than 1000°C, and at least one metal oxide ($M^H O$) having a melting point of not lower than 1800°C. The metal oxide ($M^H O$) is selected from the group consisting of ZrO_2 , TiO_2 and Ta_2O_5 . The metal oxide ($M^L O$) is selected from metal oxides other than the metal oxide (MO). A part of the metal oxide ($M^H O$) is independently present in the carrier core material for forming the coated carrier.

The Lambert patent is directed to carrier particles for use in the development of electrostatic latent images. The carrier particles comprise a hard magnetic ferrite material having a single-phase hexagonal crystal structure. The hard magnetic ferrite material is doped with an M^{n+} multi-valent metal ion. The hard magnetic ferrite material doped with the M^{n+} multi-valent metal ion is represented by the formula:



wherein: P is selected from strontium, barium, or lead; M is at least one metal selected from antimony, arsenic, germanium, hafnium, molybdenum, niobium, silicon, tantalum, tellurium, tin, titanium, tungsten, vanadium, zirconium, or mixtures thereof; and x is less than about 0.6.

As the hard magnetic ferrite material, $SrFe_{12-x}Ti_xO_{19}$, was prepared in Examples 1-4 of the Lambert patent, $SrFe_{12-x}Zr_xO_{19}$ was prepared in Examples 9-12, and $SrFe_{12-x}Ta_xO_{19}$ was prepared in Examples 33-36.

The Lambert patent fails to teach or suggest a carrier core containing at least one metal oxide ($M^L O$) having a melting point of not higher than 1000°C and at least one metal oxide ($M^H O$) having a melting point of not lower than 1800°C, as required by independent claims 16 and 17. Instead, the hard magnetic ferrite material prepared in the Examples of the Lambert patent include SrO and FeO which do not correspond to the metal oxide ($M^L O$) of independent claims 16 and 17 because SrO and FeO have a melting point over 1000°C. Therefore, the Lambert patent does not teach or suggest the claimed feature that both, at least one metal oxide ($M^L O$) and at least one metal oxide ($M^H O$), are used as essential components. Accordingly, the Lambert patent does not teach or suggest a coated carrier having excellent electrical properties such that it brings about no leakage of electric

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charge over a wide range of electric fields from a low electric field to a high electric field. Such a feature is achieved by the present invention because the carrier core material contains both a metal oxide ($M^L O$) and a metal oxide ($M^H O$) (see page 19, line 14 to page 22, line 12 of the specification of the present application).

Additionally, the Lambert patent fails to teach or suggest that a part of the metal oxide ($M^H O$) is independently present in the carrier core material for forming the coated carrier. Instead, the hard magnetic ferrite material of the Lambert patent has the single-phase hexagonal crystal structure represented by the above formula, and therefore, the multi-valent metal ion M^{n+} , which is derived from a metal oxide such as Ti_2O_3 , Zr_2O_5 or Ta_2O_5 , is incorporated into the crystal structure.

On the other hand, in the coated carrier of the claimed invention, a part of the metal oxide ($M^H O$) is independently present in the carrier core material. By allowing the high-melting point oxide ($M^H O$) to be independently present in the ferrite component without forming a solid solution, the high-melting point oxide ($M^H O$) depresses electrical conductivity among crystals of the ferrite component, thereby allowing a carrier core material capable of forming a coated carrier, which is free from leakage of electric charge even in a high electric field to be prepared (see page 20, line 5 to page 22, line 12 of the specification of the present application).

Finally, the carrier core material of the Lambert patent is a hard magnetic ferrite material. In general, a hard magnetic ferrite has the coercive force (Hc) of more than 1000 Ce (oersted). On the other hand, the coercive force (Hc) of the carrier core material of the present invention is usually not more than 50 Ce (see page 30, lines 18-22 of the specification of the present application). In addition, the specification of the present application describes that if the residual magnetization or the coercive force is too high, the developing agent has poor fluidity, and the rise of frictional charging between the coated carrier and the toner causes the phenomenon of toner fly or fog (see page 31, lines 4-8 of the specification of the present application). As is clear from this description, the carrier core material of the invention is a soft magnetic ferrite material. Accordingly, the carrier core material of the invention is different from that of the Lambert patent.

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For at least the foregoing reasons, the Applicants believe that the subject matter of independent claims 16 and 17 is not anticipated or obvious in view of the Lambert patent. Reconsideration of the rejection of claims 16 and 17 is respectfully requested.

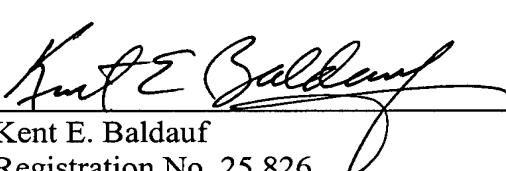
Claims 18, 19, 22-31 and 40-50 depend from and add further limitations to independent claims 16 and 17 or a subsequent dependent claim and are believed to be patentable for at least the reasons discussed hereinabove in connection with independent claims 16 and 17. Reconsideration of the rejections of claims 18, 19, 22-31 and 40-50 is respectfully requested.

Based on the foregoing amendments and remarks, reconsideration of the rejections and allowance of pending claims 16-19, 21-31 and 40-50 are respectfully requested.

Respectfully submitted,

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